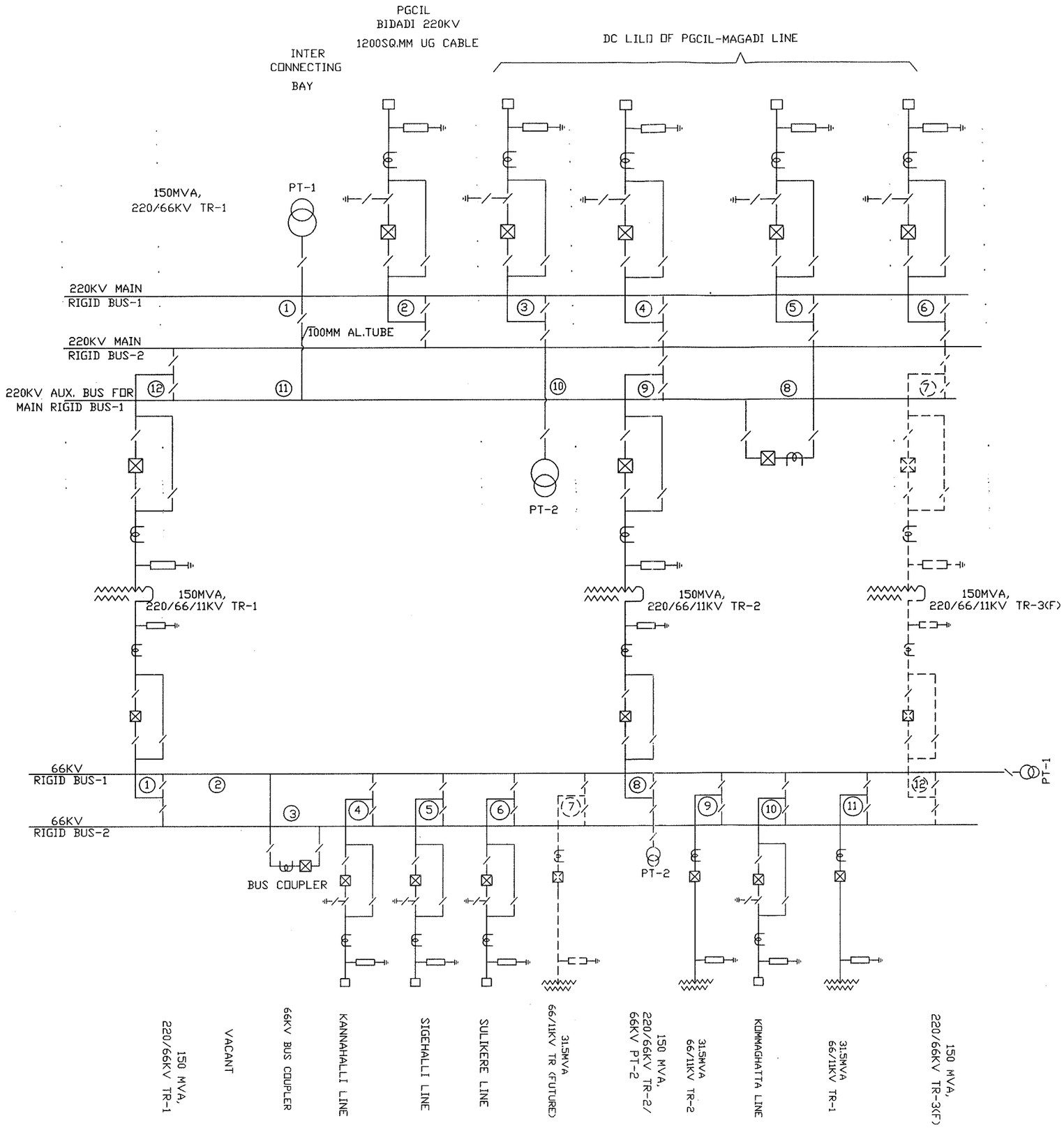
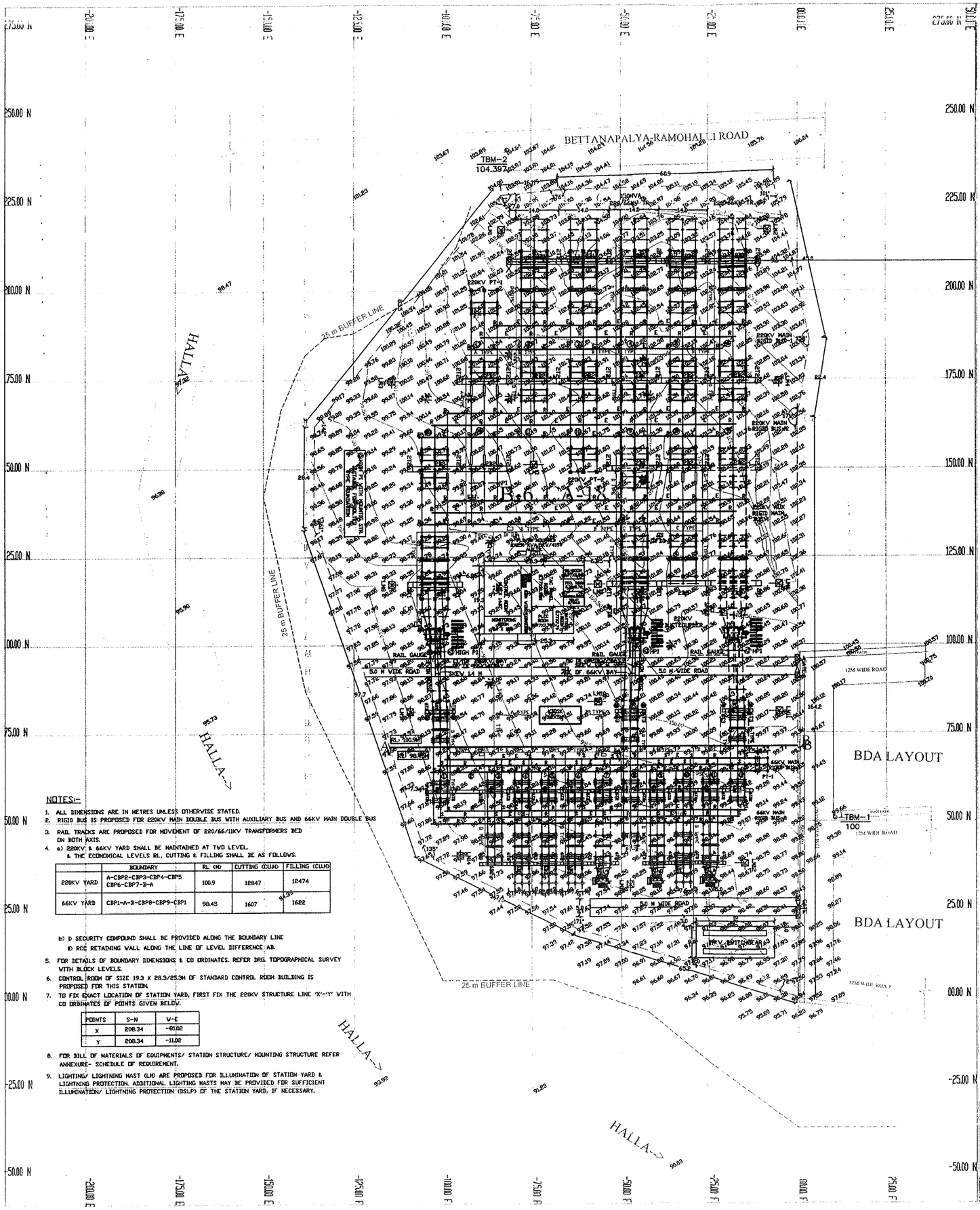


KARNATAKA POWER TRANSMISSION CORPORATION LIMITED				
SINGLE LINE DIAGRAM OF 220/66/11KV SUBSTATION AT BHEEMANAKUPPE, KEMPEGOWDA BDA LAYOUT, BENGALURU.				
DRG. NO. KPTCL/TECH/SS-220/KMPGWD BDA-1			DATE:- 14.10.2024	SCALE:- NTS
A.E	A.E.E	EE	S.E (TECH)	CEE (P&C)
DRN	CHD	SUB	REC	APPROVED



NOTES:-

1. ALL DIMENSIONS ARE IN METRES UNLESS OTHERWISE STATED.
2. RIGID BUS IS PROPOSED FOR 220KV MAIN DOUBLE BUS WITH AUXILIARY BUS AND 66KV MAIN DOUBLE BUS
3. RAIL TRACKS ARE PROPOSED FOR MOVEMENT OF 220/66/11KV TRANSFORMERS BED ON BOTH AXIS.
4. a) 220KV & 66KV YARD SHALL BE MAINTAINED AT TWO LEVEL.
   & THE ECONOMICAL LEVELS RL, CUTTING & FILLING SHALL BE AS FOLLOWS.

	BOUNDARY	RL (M)	CUTTING (CUM)	FILLING (CUM)
220KV YARD	A-CBP2-CBP3-CBP4-CBP5 CBP6-CBP7-B-A	100.9	12847	12474
66KV YARD	CBP1-A-B-CBP8-CBP9-CBP1	98.45	1607	1622

   b) D SECURITY COMPOUND SHALL BE PROVIDED ALONG THE BOUNDARY LINE
   ID RCC RETAINING WALL ALONG THE LINE OF LEVEL DIFFERENCE AB.
5. FOR DETAILS OF BOUNDARY DIMENSIONS & CO ORDINATES. REFER DRG. TOPOGRAPHICAL SURVEY WITH BLOCK LEVELS.
6. CONTROL ROOM OF SIZE 19.3 X 28.3/25.3M OF STANDARD CONTROL ROOM BUILDING IS PROPOSED FOR THIS STATION.
7. TO FIX EXACT LOCATION OF STATION YARD, FIRST FIX THE 220KV STRUCTURE LINE 'X'-'Y' WITH CO ORDINATES OF POINTS GIVEN BELOW.

POINTS	S-N	W-E
X	208.34	-81.02
Y	208.34	-11.02

8. FOR BILL OF MATERIALS OF EQUIPMENTS/ STATION STRUCTURE/ MOUNTING STRUCTURE REFER ANNEXURE- SCHEDULE OF REQUIREMENT.
9. LIGHTING/ LIGHTNING MAST CUM ARE PROPOSED FOR ILLUMINATION OF STATION YARD & LIGHTNING PROTECTION. ADDITIONAL LIGHTING MASTS MAY BE PROVIDED FOR SUFFICIENT ILLUMINATION/ LIGHTNING PROTECTION (DSLP) OF THE STATION YARD, IF NECESSARY.

Area Statement

AREA WITHIN BOUNDARY POINTS
CBP1-CBP8 = 24699 Sqm
= 265835 Sqft
= 6 Acres 4 Guntas
= 2.469 Hectores

NOTE:-

1) ALL DIMENSIONS AND LEVELS ARE IN METERS.
2) BLOCK LEVELS HAVE BEEN TAKEN AT 5.0 x 5.0 GRID AND CONTOURS HAVE BEEN DRAWN AT 0.50 M INTERVALS.
3) A BENCHMARK TBM1 HAS BEEN ESTABLISHED ON THE TOP OF EXISTING CULVERT AND ASSIGNING IT TO A VALUE OF +100.00 M ARBITRARILY.

BOUNDARY

LENGTH M			ANGLE DEGREES	
PT	TO PT	LENGTH	STATION	ANGLE
CBP1	CBP2	97.72	CBP1	136.371°
CBP2	CBP3	28.44	CBP2	160.790°
CBP3	CBP4	83.52	CBP3	141.750°
CBP4	CBP5	76.98	CBP4	184.405°
CBP5	CBP6	45.09	CBP5	101.141°
CBP6	CBP7	22.45	CBP6	158.947°
CBP7	CBP8	164.22	CBP7	171.077°
CBP8	CBP9	85.24	CBP8	78.459°
CBP9	CBP1	47.45	CBP9	171.245°

CO-ORDINATES

STATION	EASTING	NORTHING
CBP1	-104.65	40.87
CBP2	-135.90	133.46
CBP3	-135.63	161.90
CBP4	-83.30	226.99
CBP5	-06.40	230.36
CBP6	03.61	186.39
CBP7	00.13	164.22
CBP8	00.00	00.00
CBP9	-62.20	19.68

LEGEND

Perimeter Boundary with Pillars, Wire Fence,
Main Power line with Pylons, Power line, Telegraph/Telephone line
Road : Metalled, Unmetalled, Cart track, Footpath
Building : Permanent, Under construction, Temporary
Nala : Defined, Undefined, Stream : Defined, Undefined
Hut, Borewell, Pumphouse, Temple, Hand Pump — PH
Embankment, Cutting, Quarry, Hedge
Boulders, Rockyground, Relative height
Contour and form line with value, Sheet rock, Cliff, Field Bund
Trees : Jackfruit, Ordinary, Coconut, Neem , Bamboo, Others
Temporary Bench Mark, Spot level — BM @ TBM-1 / 100

CLIENT

TITLE

M/S K.S. CONSULTING ENGINEERS & SURVEYORS

SURVEY CONSULTANTS

Email : kcsdutu@gmail.com

SEASON

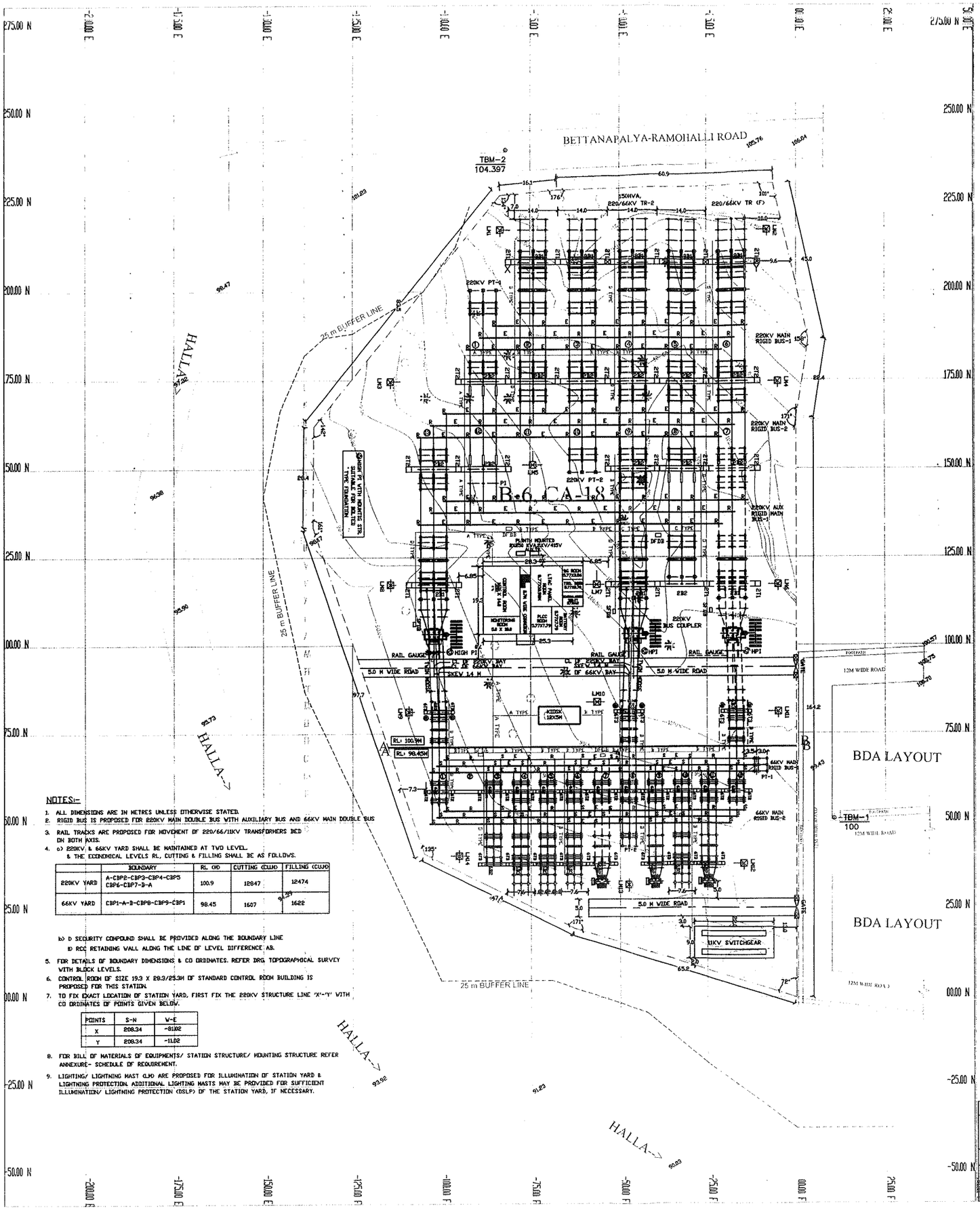
SCALE
1 : 1000

KARNATAKA TRANSMISSION CORPORATION LIMITED

SITE PLAN WITH BLOCK LEVEL OF 220/66/11KV SUB-STATION BHEEMANAKUPPE, KEMPEGOWDA BDA LAYOUT, BENGALURU.

DRG. NO. KPTCL/TECH/SS-220/KMPGWD BDA-2, DT.16.10.2024 SCALE:- NTS

AE	A.E.E	E.E	S.E (TECH)	C.E.E (P&C)
DRN	VER	SUB	REC	APPROVED



NOTES:–

1. ALL DIMENSIONS ARE IN METRES UNLESS OTHERWISE STATED.
2. RIGID BUS IS PROPOSED FOR 220KV MAIN DOUBLE BUS WITH AUXILIARY BUS AND 66KV MAIN DOUBLE BUS
3. RAIL TRACKS ARE PROPOSED FOR MOVEMENT OF 220/66/11KV TRANSFORMERS BED IN BOTH AXIS.
4. a) 220KV & 66KV YARD SHALL BE MAINTAINED AT TWO LEVEL.
   & THE ECONOMICAL LEVELS RL, CUTTING & FILLING SHALL BE AS FOLLOWS.

	BOUNDARY	RL (M)	CUTTING (CUM)	FILLING (CUM)
220KV YARD	A-CBP2-CBP3-CBP4-CBP5 CBP6-CBP7-B-A	100.9	12847	12474
66KV YARD	CBP1-A-B-CBP8-CBP9-CBP1	98.45	1607	1622

   b) D SECURITY COMPOUND SHALL BE PROVIDED ALONG THE BOUNDARY LINE
   © RCC RETAINING WALL ALONG THE LINE OF LEVEL DIFFERENCE AB.
5. FOR DETAILS OF BOUNDARY DIMENSIONS & CO ORDINATES. REFER DRG TOPOGRAPHICAL SURVEY WITH BLOCK LEVELS.
6. CONTROL ROOM OF SIZE 19.3 X 29.3/25.3M OF STANDARD CONTROL ROOM BUILDING IS PROPOSED FOR THIS STATION.
7. TO FIX EXACT LOCATION OF STATION YARD, FIRST FIX THE 220KV STRUCTURE LINE 'X'–'Y' WITH CO ORDINATES OF POINTS GIVEN BELOW.

POINTS	S-N	W-E
X	208.34	-81.82
Y	208.34	-11.02

8. FOR BILL OF MATERIALS OF EQUIPMENTS/ STATION STRUCTURE/ MOUNTING STRUCTURE REFER ANNEXURE– SCHEDULE OF REQUIREMENT.
9. LIGHTING/ LIGHTNING MAST (LM) ARE PROPOSED FOR ILLUMINATION OF STATION YARD & LIGHTNING PROTECTION. ADDITIONAL LIGHTING MASTS MAY BE PROVIDED FOR SUFFICIENT ILLUMINATION/ LIGHTNING PROTECTION (DSLP) OF THE STATION YARD, IF NECESSARY.

Area Statement

AREA WITHIN BOUNDARY POINTS
CBP1-CBP8 = 24699 Sqm
= 265835 Sqft
= 6 Acres 4 Guntas
= 2.469 Hectares

NOTE:-

1) ALL DIMENSIONS AND LEVELS ARE IN METERS.
2) BLOCK LEVELS HAVE BEEN TAKEN AT 5.0 x 5.0 GRID AND CONTOURS HAVE BEEN DRAWN AT 0.50 M INTERVALS.
3) A BENCHMARK TBM1 HAS BEEN ESTABLISHED ON THE TOP OF EXISTING CULVERT AND ASSIGNING IT TO A VALUE OF +100.00 M ARBITRARILY.

BOUNDARY

LENGTH M		ANGLE DEGREES	
PT TO PT	LENGTH	STATION	ANGLE
CBP1 CBP2	97.72	CBP1	180.371°
CBP2 CBP3	28.44	CBP2	180.799°
CBP3 CBP4	83.52	CBP3	141.750°
CBP4 CBP5	76.98	CBP4	184.409°
CBP5 CBP6	45.09	CBP5	101.141°
CBP6 CBP7	22.45	CBP6	188.847°
CBP7 CBP8	164.22	CBP7	171.077°
CBP8 CBP9	65.24	CBP8	78.489°
CBP9 CBP1	47.45	CBP9	171.845°

CO-ORDINATES

STATION	EASTING	NORTHING
CBP1	-104.65	40.87
CBP2	-135.90	133.46
CBP3	-135.63	181.90
CBP4	-83.30	226.99
CBP5	-06.40	230.36
CBP6	03.61	186.39
CBP7	00.13	164.22
CBP8	00.00	00.00
CBP9	-62.20	19.68

LEGEND

Perimeter Boundary with Pillars, Wire Fence,
Main Power line with Pylons, Power line, Telegraph/Telephone line
Road : Metalled, Unmetalled, Cart track, Footpath
Building : Permanent, Under construction, Temporary
Nala : Defined, Undefined, Stream : Defined, Undefined
Hut, Borewell, Pumphouse, Temple, Hand Pump — PH
Embankment, Cutting, Quarry, Hedge
Boulders, Rockyground, Relative height
Contour and form line with value, Sheet rock, Cliff, Field Bund
Trees : Jackfruit, Ordinary, Coconut, Neem , Bamboo, Others
Temporary Bench Mark, Spot level — BM ⊙ BM–1 / 100

CLIENT

TITLE

N.S.K.S CONSTRUCTIONS AND SURVEYORS

SURVEY CONSULTANTS

Email : nsesdata@gmail.com

SEASON

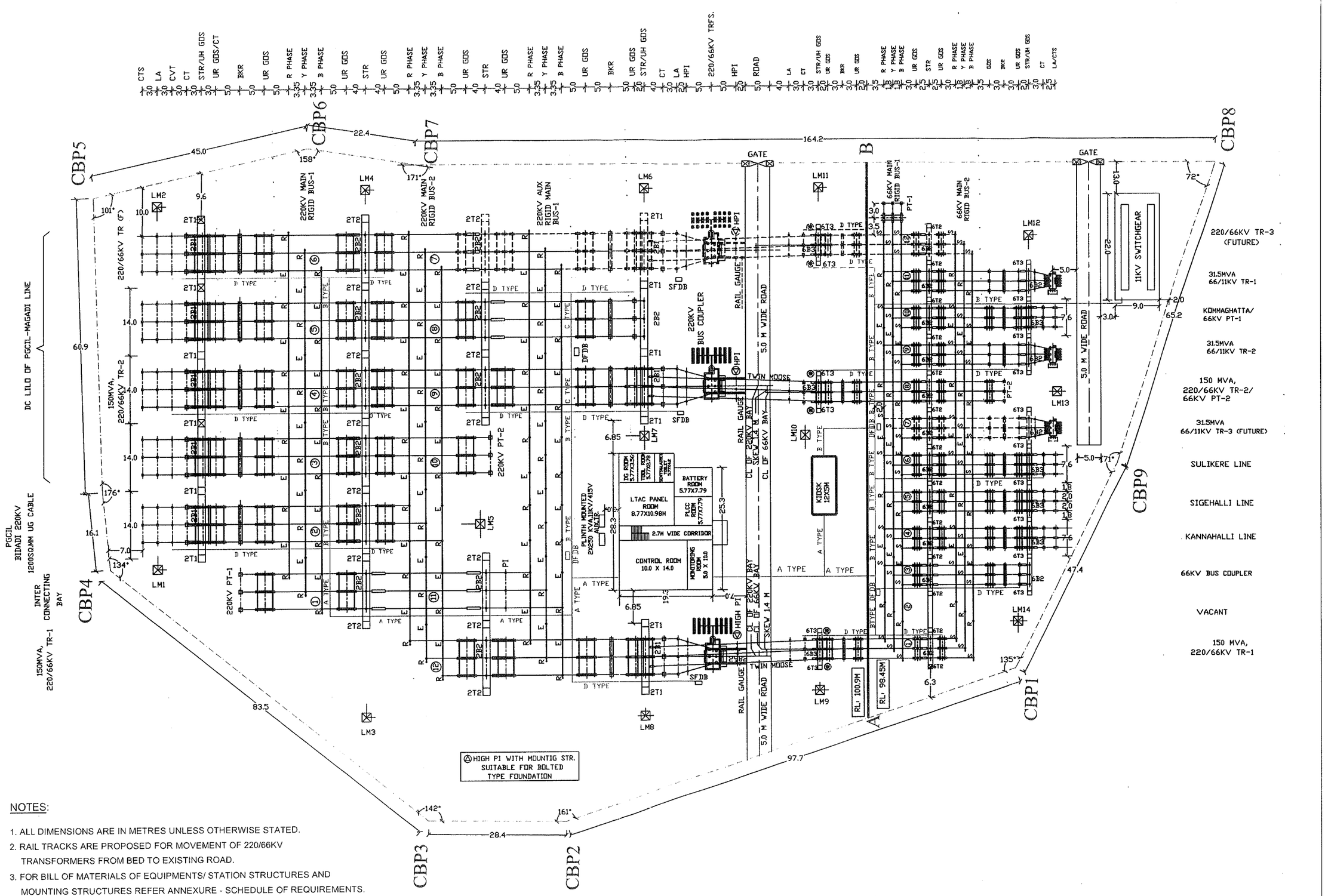
SCALE 1:1000

KARNATAKA TRANSMISSION CORPORATION LIMITED

SITE PLAN WITHOUT BLOCK LEVEL OF 220/66/11KV SUB-STATION AT BHEEMANAKUPPE, KEMPEGOWDA BDA LAYOUT, BENGALURU.

DRG. NO. KPTCL/TECH/SS-220/KMPGWD BDA-3, DT.14.10.2024 SCALE:- N.E.S

RE	A.E.E	E.E.E	S.E (TECH)	C.E.E (P&C)
DRN	VER	SUB	REC	APPROVED



NOTES:

1. ALL DIMENSIONS ARE IN METRES UNLESS OTHERWISE STATED.
2. RAIL TRACKS ARE PROPOSED FOR MOVEMENT OF 220/66KV TRANSFORMERS FROM BED TO EXISTING ROAD.
3. FOR BILL OF MATERIALS OF EQUIPMENTS/ STATION STRUCTURES AND MOUNTING STRUCTURES REFER ANNEXURE - SCHEDULE OF REQUIREMENTS.
4. OTHER REFERENCE DRAWINGS - a) SINGLE LINE DIAGRAM,b) SITE PLAN, c) CROSS SECTION.
5. THE TYPICAL LAYOUT IS DEVELOPED FOR THE GENERAL GUIDANCE OF THE BIDDER REGARDING CONCEPT OF THE PROJECT. THE DETAILED DESIGN HAS TO BE FURNISHED BY THE BIDDER.
6. ALLOCATION OF LINE BAYS ARE INDICATIVE ONLY. SAME SHALL BE FINALISED DURING EXECUTION AS PER ORIENTATION OF LINES
7. THE LOCATION OF 11KV SWITCH GEAR ROOM IS INDICATIVE ONLY.

SHEET 1 OF 2

KARNATAKA POWER TRANSMISSION CORPORATION LIMITED

LAYOUT PLAN OF PROPOSED 220/66/11KV SUB STATION AT BHEEMANAKUPPE, KEMPEGOWDA BDA LAYOUT, BENGALURU.

DRG. NO. KPTCL/TECH/SS-220/KMPGWD BDA-4		DATED-14.10.2024		SCALE :- N.T.S.
A.E	A.E.E	E.E	S.E.E (TECH)	C.E.E (P&C)
DRN	CHD	SUB	REC	APPROVED

TECHNICAL PARTICULARS

SL.NO.	PARTICULARS	220KV	66KV
1.	BASIC INSULATION LEVEL (KV)	1050	325
2.	MINIMUM CLEARANCES		
	a) BETWEEN PHASES (FOR RIGID BUS)	3.35 M	1.8 M
	b) BETWEEN PHASES (FOR STRUNG BUS)	3.65 M	2.0 M
	c) BETWEEN PHASE TO EARTH (CENTRE LINE OF TOWER)	3.35 M	1.8 M
3.	a) HEIGHT OF CROSS BUS CONDUCTOR	13.5 M	8.5 M 13.5 M
	b) BAY WIDTH	14.0 M	7.6 M
	c) HEIGHT OF MAIN BUS	5.75 M	4.25 M
4.	HEIGHT OF CENTRE OF TERMINAL PAD PERTAINING TO VARIOUS EQUIPMENTS		
	a) ISOLATORS ADJACENT TO MAIN BUS	8.25 M	5.5 M
	b) OTHER ISOLATORS AND EQUIPMENTS	5.75 M	4.25 M
5.	MATERIALS OF THE BUS		
	a) MAIN ALUMINIUM TUBE BS 1600 SCH.40	100 MM DIA	75 MM DIA
	b) CROSS BUS		
	i) ALUMINIUM TUBE BS.1600 SCH.40	63 MM DIA	63/50 MM DIA
	ii) ACSR CONDUCTOR	MOOSE/ TWIN MOOSE	MOOSE/ DOUBLE MOOSE
6.	POST INSULATORS USED FOR BUS SUPPORTS AS PER IS 5350 PART II & III		
	a) NO.OF UNITS/STACK	2	1
	b) VOLTAGE CLASS	220KV	66KV
	c) HEIGHT OF INSULATOR STACK (MM)	2300	770
	d) PITCH DIA HOLES AT TOP (MM)	127	127
	e) NO. OF FIXING BOLTS	4	4
7.	a) 11KV, 120KN DISC INSULATORS		
	i) TENSION STRING	16	6
	B) 11KV, 90KN DISC INSULATORS		
	i) SUSPENSION STRING	14	6

8. ROUTE OF PROPOSED CABLE DUCT FOR A,B,C&D TYPES ARE INDICATED IN THE LAYOUT PLAN. FROM MAIN DUCTS ie. A/B/C/D TYPE TO THE RESPECTIVE EQUIPMENTS 'E' TYPE HDPE PIPE SHALL BE PROVIDED FOR THE COMBINATION OF CONTROL & POWER CABLE AND 'F' TYPE SHALL BE PROVIDED FOR ONLY CONTROL/ POWER CABLE. REFER TYPES OF CABLE DUCTS DRAWING FOR OTHER DETAILS.

9. OTHER REFERENCE DRAWINGS –
   a) LAYOUT PLAN
   b) SITE PLAN WITH BLOCK LEVELS.
   c) CROSS SECTION THROUGH VARIOUS BAYS.
   d) TYPES OF CABLE DUCT.

NOTES:–

1. ALL DIMENSIONS ARE IN METRES UNLESS OTHERWISE STATED.
2. RIGID BUS IS PROPOSED FOR 220KV MAIN DOUBLE BUS WITH AUXILIARY BUS AND 66KV MAIN DOUBLE BUS.
3. RAIL TRACKS ARE PROPOSED FOR MOVEMENT OF 220/66/11KV TRANSFORMERS BED ON BOTH AXIS.
4. a) 220KV & 66KV YARD SHALL BE MAINTAINED AT TWO LEVEL.
   & THE ECONOMICAL LEVELS RL, CUTTING & FILLING SHALL BE AS FOLLOWS.

	BOUNDARY	RL (M)	CUTTING (CU.M)	FILLING (CU.M)
220KV YARD	A–CBP2–CBP3–CBP4–CBP5 CBP6–CBP7–B–A	100.9	12847	12474
66KV YARD	CBP1–A–B–CBP8–CBP9–CBP1	98.45	1607	1622

   b) i) SECURITY COMPOUND SHALL BE PROVIDED ALONG THE BOUNDARY LINE
   ii) RCC RETAINING WALL ALONG THE LINE OF LEVEL DIFFERENCE AB.
5. FOR DETAILS OF BOUNDARY DIMENSIONS & CO ORDINATES. REFER DRG. TOPOGRAPHICAL SURVEY WITH BLOCK LEVELS.
6. CONTROL ROOM OF SIZE 19.3 X 28.3/25.3M OF STANDARD CONTROL ROOM BUILDING IS PROPOSED FOR THIS STATION.
7. RCC TYPE SWITCHYARD PANEL ROOM (AC KIOSK) OF SIZE 12MX5M IS PROPOSED FOR ACCOMODATION OF 66KV & 11KV CONTROL AND RELAY PANEL.
8. TO FIX EXACT LOCATION OF STATION YARD, FIRST FIX THE 220KV STRUCTURE LINE 'X'–'Y' WITH CO ORDINATES OF POINTS GIVEN BELOW.

POINTS	S–N	W–E
X	208.34	–81.02
Y	208.34	–11.02

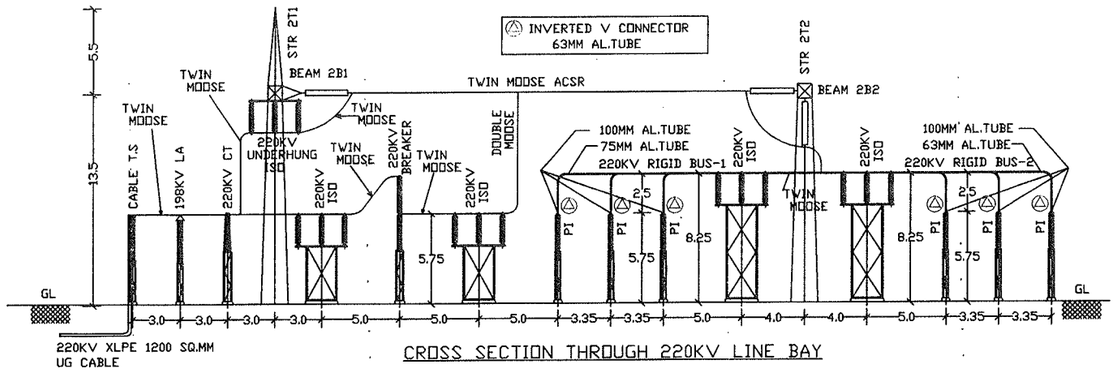
9. FOR BILL OF MATERIALS OF EQUIPMENTS/ STATION STRUCTURE/ MOUNTING STRUCTURE REFER ANNEXURE– SCHEDULE OF REQUIREMENT.
10. LIGHTING/ LIGHTNING MAST (LM) ARE PROPOSED FOR ILLUMINATION OF STATION YARD & LIGHTNING PROTECTION. ADDITIONAL LIGHTING MASTS MAY BE PROVIDED FOR SUFFICIENT ILLUMINATION/ LIGHTNING PROTECTION (DSLP) OF THE STATION YARD, IF NECESSARY.

KARNATAKA POWER TRANSMISSION CORPORATION LIMITED

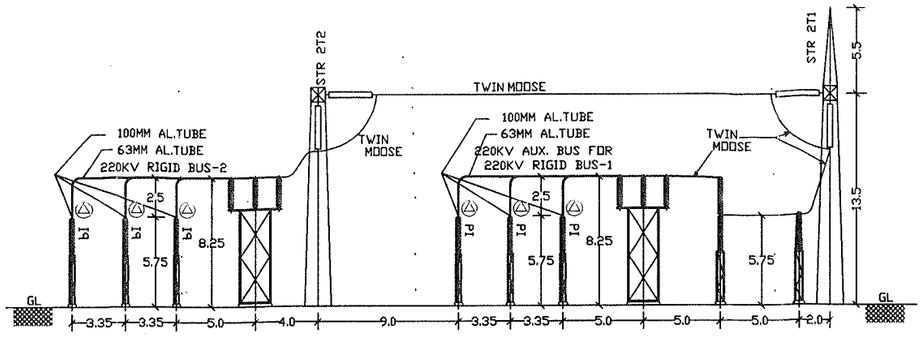
TECHNICAL PARTICULARS OF 220/66/11KV SUB–STATION AT BHEEMANAKUPPE, KEMPEGOWDA BDA LAYOUT, BENGALURU.

RG. NO. KPTCL/TECH/SS–220/KMPGWD BDA–3 DATE:–14.10.2024 SCALE:– N.T.S

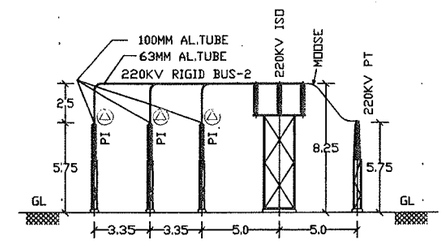
A.E	A.E.E	E.E	S.E (TECH)	C.E.E (P&C)
DRN	CHD	SUB	REC	APPROVED



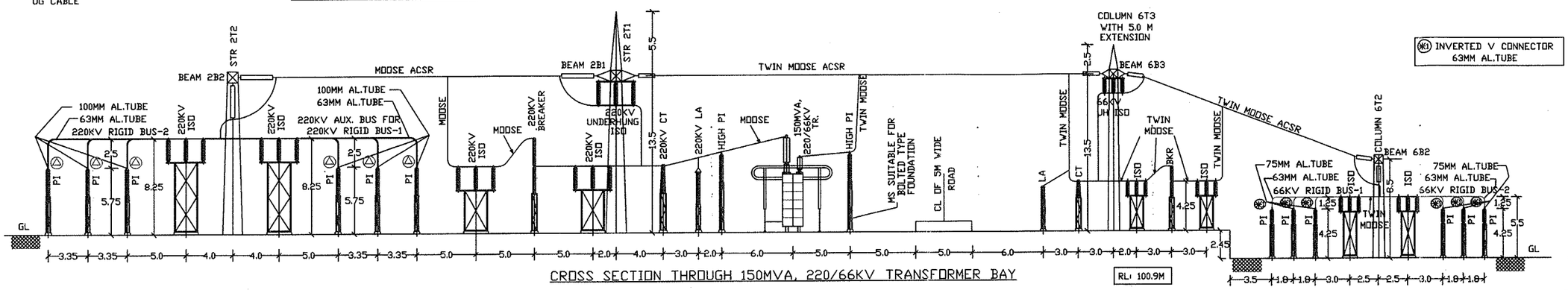
CROSS SECTION THROUGH 220KV LINE BAY



CROSS SECTION THROUGH 220KV BUS COUPLER BAY



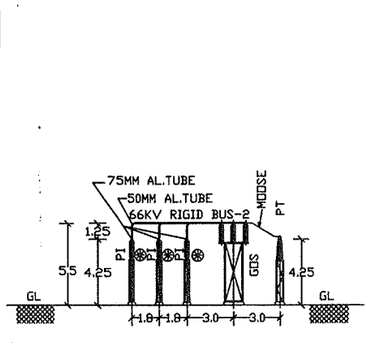
CROSS SECTION THROUGH 220KV PT-2 BAY



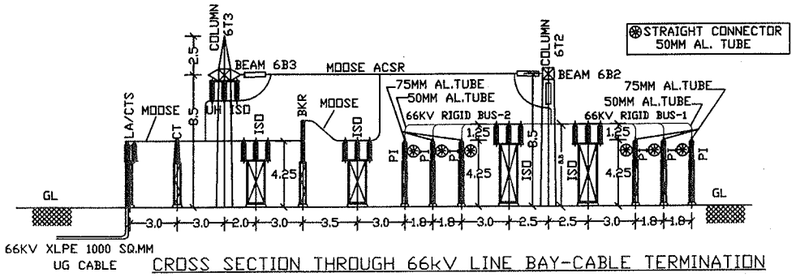
CROSS SECTION THROUGH 150MVA, 220/66KV TRANSFORMER BAY

RL: 100.9M

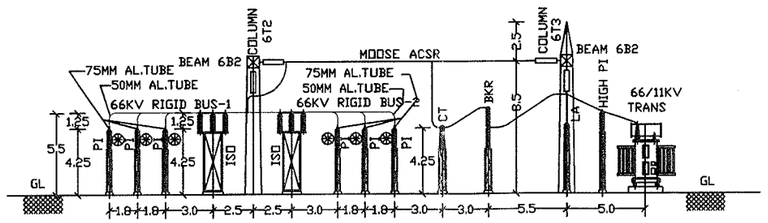
RL: 98.45M



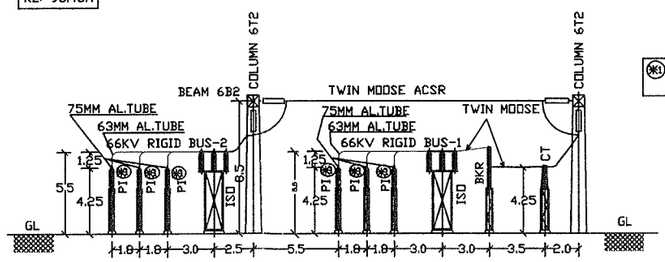
CROSS SECTION THROUGH 66KV PT-2 BAY



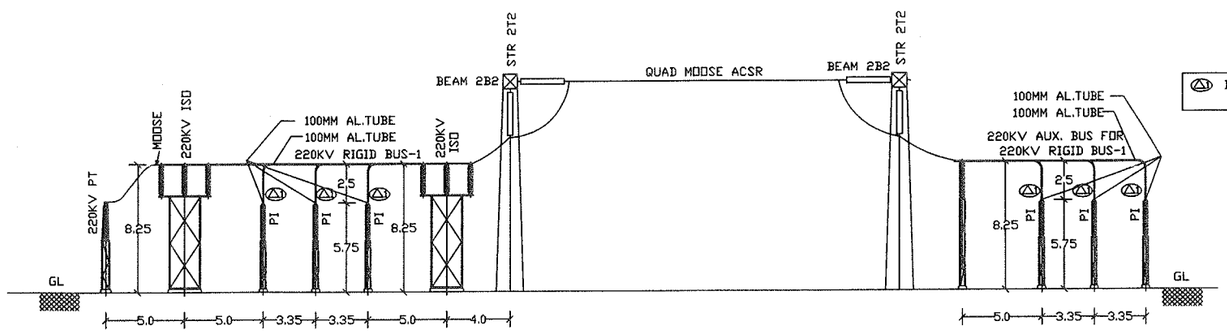
CROSS SECTION THROUGH 66kV LINE BAY-CABLE TERMINATION



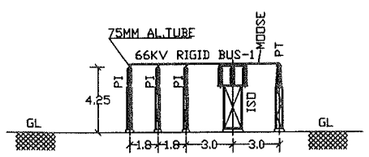
CROSS SECTION THROUGH 66/11KV TRANSFORMER BAY



CROSS SECTION THROUGH 66KV BUS COUPLER BAY



CROSS SECTION THROUGH 220kV INTECONNECTING BAY AND 220KV PT-1 BAY



CROSS SECTION THROUGH 66KV PT-1 BAY

NOTE:-
ALL DIMENSIONS ARE IN METRES.

KARNATAKA POWER TRANSMISSION CORPORATION LIMITED

CROSS SECTION THROUGH VARIOUS BAYS OF 220/66/11KV SUBSTATII
BHEEMANAKUPPE, KEMPEGOWDA BDA LAYOUT, BENGALURU

DRG. NO. KPTCL/TECH/SS-220/KMPGWD BDA-5			DATE:- 14.10.2024	SCALE:- NTS
A.E	A.E.E	E.E	S.E (TECH)	CEE (P&C)
DRN	CHD	SUB	REC	APPROVED